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DEPARTMENT OF HIGHWAYS
PLANNING AND RESEARCH BUREAU WORK PROGRAM
AND
ESTIMATE OF EXPENDITURES
FOR THE FISCAL YEAR
JULY 1, 1978 - JUNE 30, 1979
PROJECT HPR-PL-1(17)

STATE OF MONTANA
DEPARTMENT OF HIGHWAYS
PLANNING AND RESEARCH BUREAU

IN COOPERATION WITH
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

May, 1978

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INTRODUCTION TO HPR-PL-1(17)

Project HPR-PL-1(17) provides for the continuing efforts of the Montana Department of Highways in planning and research activities. It includes the activities of the Metropolitan Planning Organizations (MPO) who provide a separate Unified Work Program document that is a supplemental to this work program document.

The Planning and Research Bureau of the Department of Highways, the State agency charged with the administration of the program, is a subsection of the Preconstruction Division. The relationship of the Planning and Research Bureau to other Bureaus and Divisions of the Department are illustrated by the charts on Page two and three.

The following is a brief summarization of the various volumes contained in this document. End products are described for each work program item under the element description, the following provides a general overview of the major work areas.

PART I - PLANNING ACTIVITIES

Administration and Control - The activities included in this volume provide for the general administration of the planning program. The necessary coordination of all activities, including the efforts of the MPO's in transportation planning process, are provided for.

Road Inventory - The variety of work program elements contained in this volume provide for the collection of basic physical data of the entire roadway network in the State. The collected data provides a basic source of information used for many purposes such as the allocation of State funds, determining priorities, and developing construction programs.

MAPPING - In addition to providing a record of the roadway system in the State, counties and urban areas these maps provide information on the extent of cultural development. The maps are used extensively by the general public for a variety of purposes.

The maps provide a system of depicting part of the data collected in the previous volume.

Traffic - The collection of traffic data provides a method of measuring the pulse of activities throughout the State, and provides a basis for estimating future traffic volumes for various highway improvement projects.

The loadometer survey provides information for determining the frequency and extent of the vehicle loadings. This information is used extensively in determining future pavement designs as well as other geometric designs.

Highway Statistics - The data collected in previous volumes as well as additional data concerning State and local finance and the characteristics of vehicles and operators is contained in this volume.

Road Log information provides the basic data for the Highway Information System and must be continually updated as the Federal aid systems change.

Economic and Fiscal - This area concerns the display of data collected concerning the physical feature of highway projects and the costs involved in contract lettings. This information has many uses and provides a constant source of information on the roadway and the costs associated in construction of the roadway.

Statewide Transportation Planning - A very important function of planning activities is the continued surveillance of the status of needs and the programming of limited funds in an attempt to satisfy these needs. This volume provides for these functions, a very important part of the total program since the activities of the Department of Highways depends a great

deal on the products of these work items.

Urban Transportation Planning - In addition to the 3-C Process underway in the two urbanized areas of the State, as described in the UWP's that are a supplement to this document, urban transportation planning has been extended to the smaller urban areas of the State.

Attempts have been made to pattern small urban area transportation planning after the 3-C Process. The process has been scaled down according to the size and activity of the area, however the basic organization and end products are similar.

Speed and Traffic Service Studies - The involvement of the highway user as associated with the speeds he travels and the accidents that occur, is an important consideration in highway planning. The efforts of safety programs to control speeds and to eliminate hazards of the roadway are associated with these studies, providing information to all levels of government.

Special Studies - There are certain tasks that must be undertaken as special studies due to the demands of the various levels of government or as demands dictated by the system itself. This volume provides for the collection of these studies in one area of the work program.

Some of the studies are a carryover from previous years and are being phased out, while other studies are new or anticipated. All are considered to be necessary to some phase of the continuing planning effort.

PART II - RESEARCH AND DEVELOPMENT

This part of the work program provides for the essential research and development associated with the total highway program. In addition to providing for the administration of the program this part provides for the various research projects. Most of the projects concern research of materials involved in roadway construction.

ESTIMATE OF ACTIVITIES AND EXPENDITURES
OF PLANNING AND RESEARCH BUREAU
FOR THE PERIOD OF JULY 1, 1978 - JUNE 30, 1979

HPR-PL-1(17)

PART I - PLANNING ACTIVITIES

Administration and Control (Volume I, Chapter I)
Item P-1 - Program Management (Participating)

Objectives:

To finance work program management and administrative activities related to planning.

Accomplishments 1978 FY:

The following activities were financed under this item:

1. A substantial part of the salaries of the chief, his assistant, secretarial staff and accountant.
2. The cost of supplies and materials that cannot be separately identified and charged to specific projects.
3. Salaries and expenses of planning personnel attending Federal Highway Administration approved meetings and workshops.

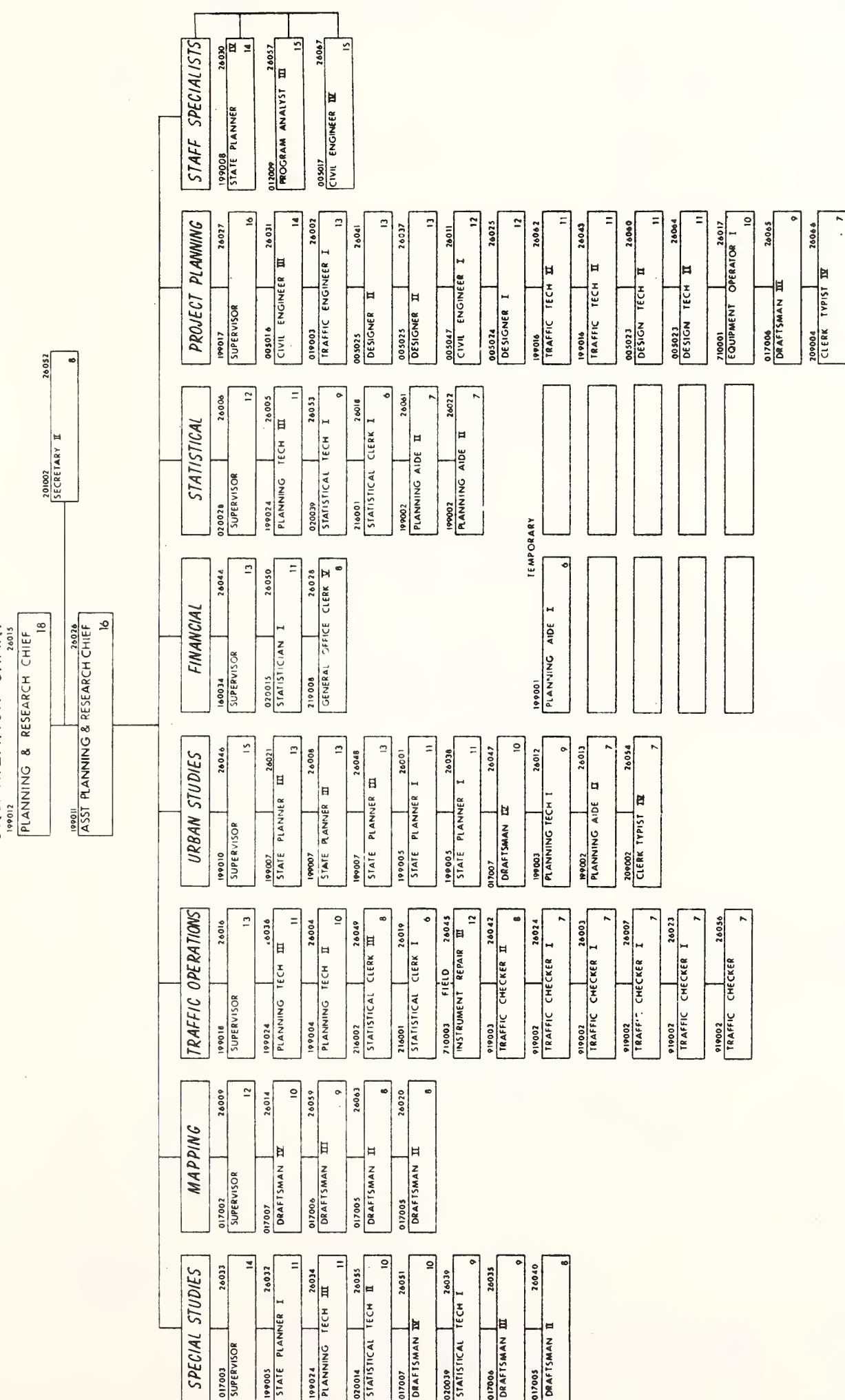
Proposed Activities 1979 FY:

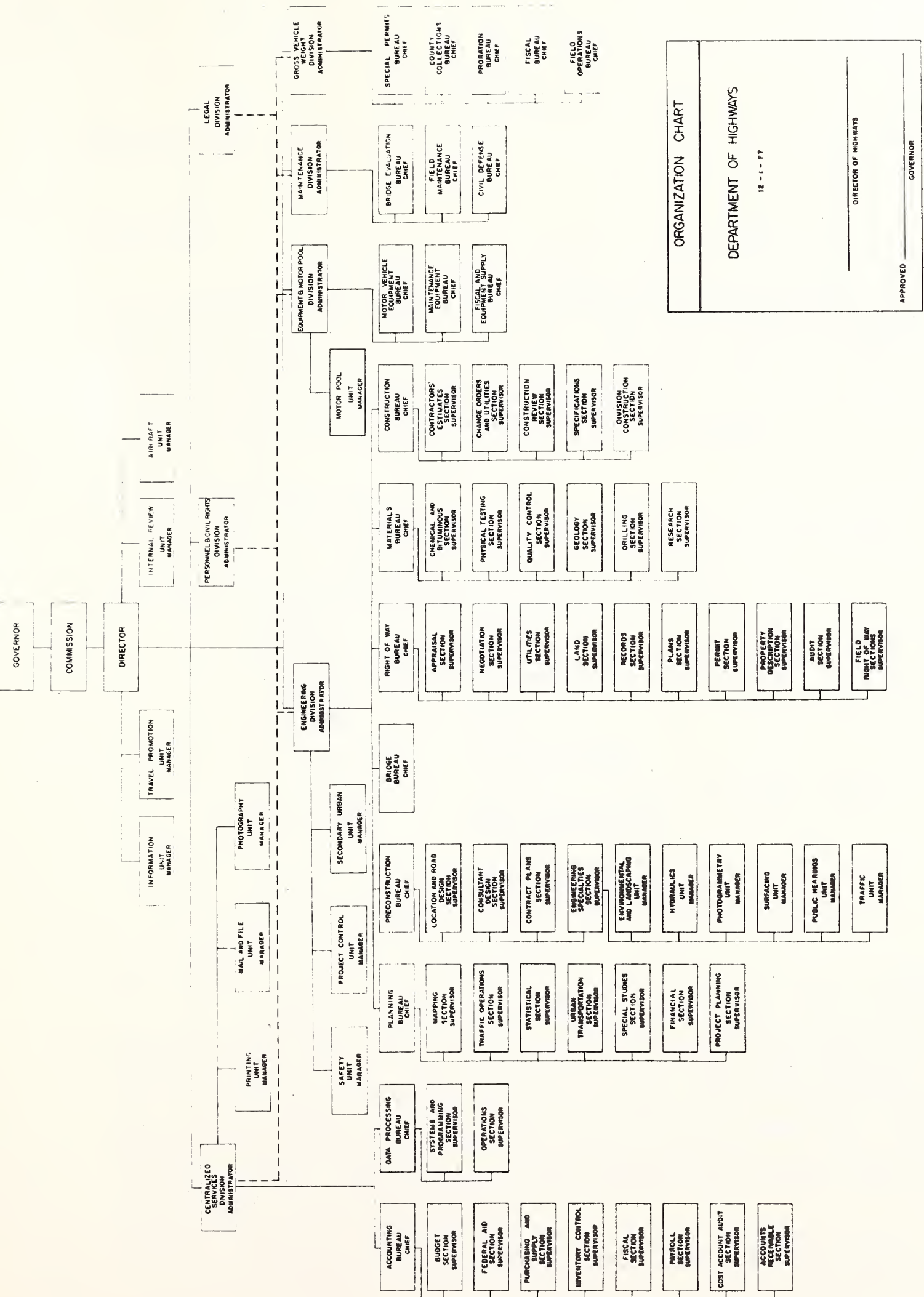
It is proposed to finance substantially the same activities during the next fiscal year.

Estimated Costs:

Programmed 1978 FY	\$75,000
Estimated Expenditures 1978 FY	\$78,000
Estimated Costs 1979 FY	\$86,000

MONTANA DEPARTMENT OF HIGHWAYS PLANNING & RESEARCH BUREAU ORGANIZATION CHART





ROAD INVENTORY

Rural and Urban (Volume 2, Chapter I)
Item P-2

Objectives:

To obtain and maintain a complete inventory of every county road and city street in the State. The information from the inventory is coded and becomes part of the HIS Data Bank. The records are used primarily in updating maps, in allocating state user funds to the local jurisdictions and for compiling various mileage reports on the local systems.

Accomplishments 1978 FY:

Field inventory of the following five counties and thirteen incorporated cities was completed during the fiscal year.

<u>Counties</u>	<u>Cities</u>
1. Deer Lodge	Anaconda
2. McCone	Circle
3. Richland	Fairview, Sidney
4. Roosevelt	Bainville, Brockton, Culbertson, Froid, Poplar, Wolf Point
5. Valley	Glasgow, Nashua, Opheim

The planned accomplishments were not achieved due to the high turnover and other personnel problems.

Contacts were again made with the county commissioners or county engineers in the other fifty-one counties to obtain data on the amount and type of road construction completed during the year. Other road building agencies in the State were also contacted to obtain current road data on their respective systems. These data were used to update road inventory files in the counties that were not reinventoried.

Officials of all the incorporated cities in the State were

contacted concerning the amount and type of city streets that were constructed during the year and any changes that may have occurred in the corporate city limits.

All road information for counties inventoried during the 1978 fiscal year was coded for inclusion in the Data Bank. Prints of our road numbered maps as well as computer printouts of road data, were sent to the counties on request for use in their signing inventory and other local projects.

Proposed Activities 1979 FY:

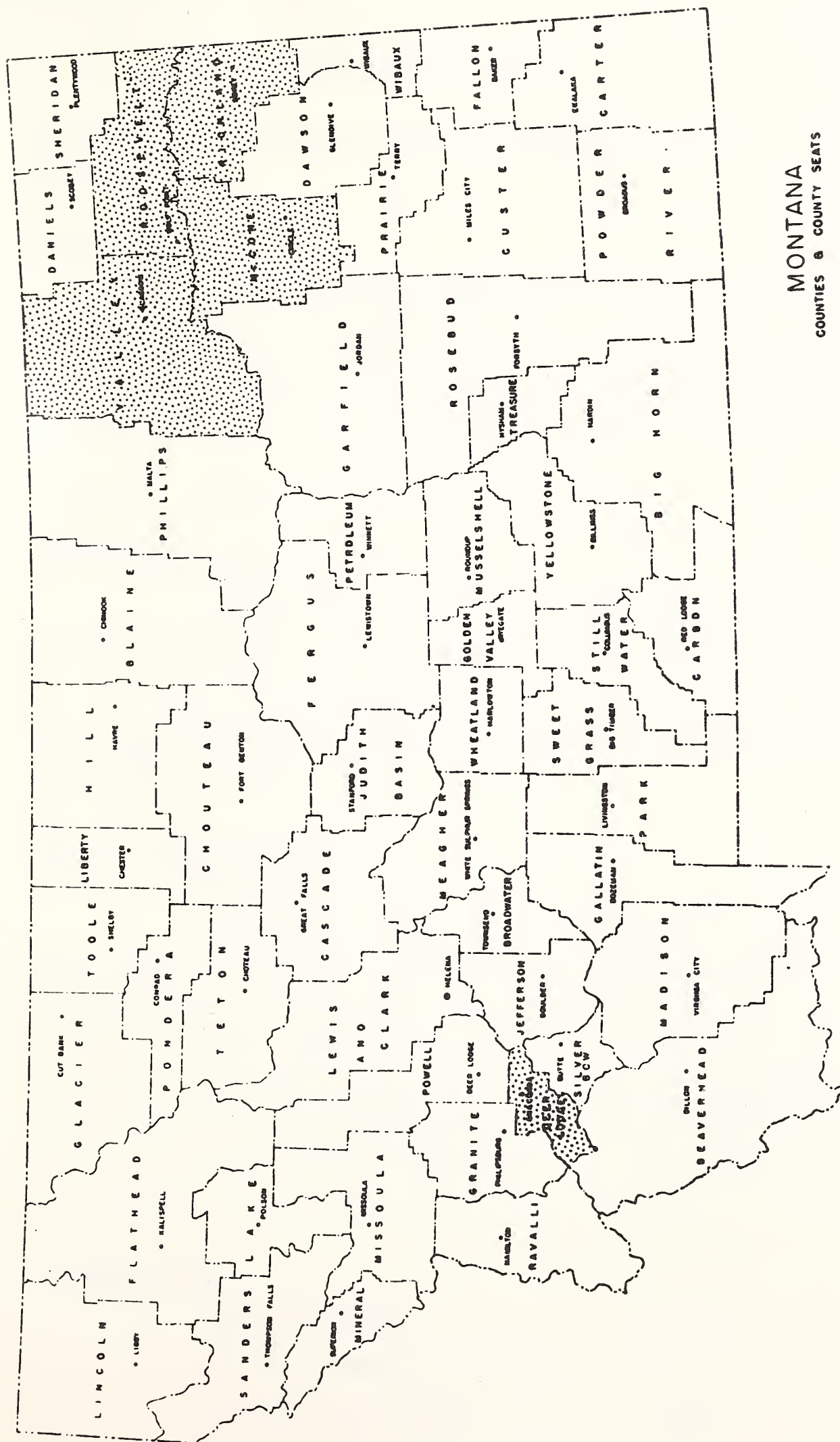
Contacts will be made statewide by our field representative with construction officials from the Bureau of Land Management and the representatives from each individual National Forest and Indian Reservation.

Appointments will also be arranged with the county commissioners, the local city officials, other locally involved knowledgeable personnel, and any other officials locally based governing bodies of half of the counties of the State in order to review any construction changes required for the updating of our maps and records.

Construction claims collected from all these governing bodies will be field checked and proven construction change data will be incorporated into the respective map originals and coded in format suitable for inclusion into the Data Bank.

Estimated Costs:

Programmed 1978 FY	\$65,000
Estimated Expenditures 1978 FY	\$60,000
Estimated Cost 1979 FY	\$60,000



**MONTANA
COUNTIES & COUNTY SEATS**

Completed County Inventory 1978 FY

ROAD INVENTORY (Con't)

Bridge Records for Defense Requirements (Volume 2, Chapter II)
Item P-3

Objectives:

To provide current bridge information on an annual basis to the Defense Department on selected routes that may be used for military traffic. This study also provides our Bridge Bureau and Maintenance Division with a current listing of all major structures on the Federal-aid Systems by type, length, etc. along with bridge statistical tables.

Accomplishments 1978 FY:

The Planning and Research H.I.S. data bank file was updated to reflect all revisions, new construction, and maintenance. A bridge list was also compiled, printed and distributed. The bridge records for defense requirements were updated, a new map was produced, and transmitted to the Federal Highway Administration.

Proposed Activities 1979 FY:

Bridge listing will be compiled and published as usual. This publication will reflect all changes due to construction, maintenance, realignment, etc. that have been accomplished during fiscal year 1979. Data on local bridges will be coded into the H.I.S. Data Bank as counties are re-inventoried. Missile transport erector routes and other non-federal aid structures will be included for the pre-attack input data and the Defense Bridge Report.

Estimated Costs:

Programmed 1978 FY	\$10,000
Estimated Expenditures 1978 FY	\$13,000
Estimated Costs 1979 FY	\$18,000

ROAD INVENTORY (Con't)

Railroad Crossing Hazard Ratings (Volume 2, Chapter III)
Item P-4

Objectives:

To maintain a current file on all Federal Aid and local system highway railroad crossings in the State and maintain hazard ratings on these crossings. These hazard ratings are used to determine priorities for additional protection and possible crossing elimination.

Accomplishments 1978 FY:

All the on system highway railroad grade crossings in the State have been inventoried. The data from field inventory, railroad officials and other sources is available to conform with the National Railroad-Highway Crossing Inventory Update Manual Procedures. All change data has been filed and the crossings have been updated.

Proposed Activities 1979 FY:

It is planned to update the railroad grade crossing data as new data becomes available from field inventory information, railroad reports and other sources. All crossing data will be coded in a format compatible with our hazard rating program. Hazard ratings will be computed for all crossings located on the Federal aid and local systems.

The railroads and the National Information Center will be informed of any changes in railroad grade crossing data in conformance with the National Railroad-Highway Crossing Inventory Update Manual Procedures.

Item P-4 Continued

Estimated Costs:

Programmed 1978 FY	\$10,000
Estimated Expenditures 1978 FY	\$10,000
Estimated Costs 1979 FY	\$ 4,000

ROAD INVENTORY (Con't)

Traffic Control Devices Inventory (Volume 2, Chapter IV)
Item P-5

Objectives:

To obtain a record of the location and type of existing signs and traffic control devices on the Federal-aid Primary and State maintained Federal-aid Secondary Systems. From this information, it will be possible to determine the extent of conformance with approved standards, identify the location of needed corrections and provide a basis for estimated costs of improvements.

Accomplishments 1978 FY:

The Division Traffic Engineers have been furnished an IBM printout of the sign inventory for field checking. Missing signs, changes in signing and new primary routes are being noted and the inventory updated accordingly.

Proposed Activities 1979 FY:

It is planned to update the existing files and add the additional files required for the new primary routes. Also to establish a reliable system to maintain the entire inventory with continuous update information.

The Traffic Engineering Unit will have the responsibility of this update.

Estimated Costs:

Programmed 1978 FY	\$5,000
Estimated Expenditures 1978 FY	\$3,000
Estimated Costs 1979 FY	\$8,000

ROAD INVENTORY (Con't)

Photographic Inventory of Federal-aid Systems (Volume 2, Chapter V)
Item P-6

Objectives:

To obtain one 35 mm color photograph every one-hundreth of a mile in each direction on the Interstate, Primary and selected routes on the Secondary System. It is anticipated that these photos will be used extensively to locate hazardous roadway conditions, in inventorying encroachments on right-of-way and as an aid in inventorying traffic control devices.

Accomplishments 1978 FY:

A new camera and components were purchased and installed during the year. About 1,450 two way miles of new photo log have been obtained as of April 1, 1975 with another 1,400 two way miles expected to be completed by July 1, 1978.

Proposed Activities 1979 FY:

It is anticipated that between 4,000 and 5,000 one way miles of highway will be photologged in FY 1979. This will make the total program approximately 70 percent complete.

Estimated Costs:

Programmed 1978 FY	\$25,000
Estimated Expenditures 1978 FY	\$32,000
Estimated Costs 1979 FY	\$22,000

ROAD INVENTORY (Con't)

Skid Resistance Inventory of Federal-Aid Systems (Volume 2, Chapter VI)
Item P-7

Objectives:

To determine the low skid resistant sections of the Federal-aid systems and on local highways, by inventorying and testing of the highway pavement with a K.J. Law Skid Resistance Testing System. The results of this inventory are used to identify safety projects relating to slick pavement throughout the State and by the Department of Highways Maintenance Division as a guide to maintenance activities.

Accomplishments 1978 FY:

A reinventory of all Primary and State maintained Secondary roads was started. The inventory was started in the western end of the State and approximately one-half of the State has been completed. Skid tests were made at one-half mile intervals. Reinventory of critical sections of Interstate, Primary, and Secondary highways was also accomplished. Special skid resistance studies were taken at accident cluster sites, and results were used in determining corrective measures.

Tests of maintenance pavement improvements were taken, to determine which asphalts provided the best skid resistance surface and a report with recommendations was issued to the Maintenance Administrator and Chiefs.

The skid data obtained from the inventories was processed for computer manipulation and has been added to our Highway Information System.

State Maintenance Chiefs were notified of all tested sections.

Proposed Activities 1979 FY:

The reinventory of the Federal-aid highway system will be continued and tests will be taken at $\frac{1}{2}$ mile increments in both directions of travel. All concrete bridge decks will be tested as part of the inventory. Accident cluster sites will be tested where necessary.

Those sections of highway having low skid numbers will be selected for either resurfacing or surface treatment and a program will be developed for eliminating those sections with low skid numbers over a period of years.

Contacts will be made with County and City officials to offer them the opportunity to have the paved roads under their jurisdiction tested for skid resistance by the State.

Estimated Costs:

Programmed 1978 FY	\$25,000
Estimated Expenditures 1978 FY	\$20,000
Estimated Costs 1979 FY	\$25,000

ROAD INVENTORY (Con't)

No Passing Zone Inventory (Volume 2 Chapter VII)
Item P- 8

Objectives:

To establish uniform no passing zones on all highways on the Federal-aid Primary System and selected paved routes on the Federal-aid Secondary System.

Accomplishments 1978 FY:

The three man crew completed the inventory of the Federal-aid Primary System. The field data was transferred from tape to IBM code sheets to store data in the computer which will be sent to each field Maintenance Chief. Field maintenance personnel field referenced the no passing zone at State expense.

We feel that the inventory has been completed and there will be very little future activity.

Proposed Activities 1979 FY:

To handle the routine inquiries concerning this activity and make any modifications required.

Estimated Costs:

Programmed 1978 FY	\$20,000
Estimated Expenditures 1978 FY	\$12,000
Estimated Costs 1979 FY	\$ 1,000

ROAD INVENTORY (Con't)

Photographic Inventory of Railroad Crossings (Volume 2, Chapter VIII)
Item P- 9

Objectives:

To obtain low level aerial photography of all mainline railroad trackage in the State so that prints of the crossing area can be produced on a scale of approximately 1 inch = 100 feet covering an area of approximately 650 feet on each side of the track.

It is anticipated that the crossing photos will be used extensively in developing priorities for the signalization of railroad crossings under our safety program.

Accomplishments 1978 FY:

As of March 1, 1978, 60 percent or 3,000 miles of railroad trackage has been photographed and entered into the aerial photo file. It is anticipated that an additional 1000 miles will be completed by July 1, 1978.

Proposed Activities 1979 FY:

The remaining 750 miles will be photographed to complete the project. It is also planned to add crossing numbers to the photo index this fiscal year.

Estimated Costs:

Programmed 1978 FY	\$20,000
Estimated Expenditures 1978 FY	\$20,000
Estimated Costs 1979 FY	\$ 2,000

ROAD INVENTORY (Con't)

Historic Bridges Inventory (Volume 2, Chapter IX)
Item P-10

Objectives:

To evaluate, inventory and maintain a listing of bridges on the Federal Aid Highway System that may have historic, engineering or architectural significance.

Accomplishments 1978 FY:

None. This is a new project.

Proposed Activities 1979 FY:

Criteria will be established for bridges to qualify as a historic bridge. The Planning and Research H.I.S. Data Bank Bridge file, bridge listings and local roads inventory will be used to select data for a preliminary historic bridge list. To establish a committee to review and select bridges to be designated as historic.

Estimated Cost:

Programmed 1978 FY	-0-
Estimated Expenditures 1978 FY	-0-
Estimated Costs 1979 FY	\$5,000

MAPPING

County Maps (Volume 3., Chapter I)
Item P-11

Objectives:

To produce and maintain a complete set of up-to-date maps of all counties in Montana on scales of 1" = 1 mile; $\frac{1}{2}$ " = 1 mile; and $\frac{1}{4}$ " = 1 mile. All maps of counties that are currently being reinventoried will be updated the following year to reflect the new inventory.

These county maps are the only complete up-to-date set in the State. They are used extensively by all divisions of the Department of Highways and the Federal Highway Administration and are sold at cost to other agencies and to the general public.

Accomplishments 1978 FY:

The full scale county map originals were revised to reflect the field inventory of the five counties inventoried in FY 1978. These five county maps were photographically reduced to make half scale reproducibles.

Revision of the remaining fifty-one county map originals was completed to reflect the construction changes requested from the various road and bridge building agencies within these counties.

Proposed Activities 1979 FY:

The set of county maps will be revised to reflect major changes in road networks as indicated by reinventory or obtained by direct contact from the various road building agencies in the State.

Estimated Costs:

Programmed 1978 FY	\$61,000
Estimated Expenditures 1978 FY	\$60,000
Estimated Costs 1979 FY	\$61,000

MAPPING

State Maps (Volume 3, Chapter II)
Item P-12

Objectives:

To produce a State tourist map, State systems map and other State maps as necessary.

Accomplishments 1978 FY:

All changes on our 1978 Official Tourist Map were compiled, submitted to the map and printing contractors. One million maps were printed. A new State Federal-aid Systems map was drafted.

Proposed Activities 1979 FY:

Necessary changes on the official State tourist map will be compiled and submitted to the map and printing contractors as usual.

The State F.A. System maps will be updated to show changes occurring during the year. A new State General Highway Map will be drafted. This map will show counties, Federal and State reservations, cities and towns, principal water features, Interstate, U.S. Numbered Highways, Federal-Aid Highways, etc.

Estimated Costs:

Programmed 1978 FY	\$10,000
Estimated Expenditures 1978 FY	\$10,000
Estimated Costs 1979 FY	\$18,000

MAPPING (Con't)

Mapping - Urban (Volume 3, Chapter III) Item P- 13 Incorporated City Plats

Objectives:

To produce and maintain a complete set of up-to-date plats for all of the 126 incorporated cities in Montana and to publish a city plat book every two years of all city plats with corresponding aerial photography.

These city plats are the only set in the State that are kept current. They are used extensively by other departments of the State Department of Highways and are sold at cost to other agencies and the general public.

Accomplishments 1978 FY:

All incorporated city plats were revised to reflect changes in corporate limits, street construction and changes in the Federal-aid Systems.

New urban area plats were produced for the following urban cities:

- | | |
|----------------|---------------|
| 1. Glendive | 4. Lewistown |
| 2. Great Falls | 5. Livingston |
| 3. Kalispell | 6. Missoula |

New urban plats of all the thirteen urban areas located in the State are now completed.

New city plats were produced for the following incorporated cities:

- | | |
|-------------------|----------------|
| 1. Cascade | 6. Kalispell |
| 2. Columbia Falls | 7. Shelby |
| 3. Dillon | 8. Walkerville |
| 4. East Helena | 9. Wolf Point |
| 5. Fort Benton | |

Item P- 13 Continued

New city-wide vicinity plats were produced for the following incorporated cities:

- | | |
|---------------|---------------------------|
| 1. Belgrade | 15. Lodge Grass |
| 2. Big Sandy | 16. Plains |
| 3. Big Timber | 17. Poplar |
| 4. Broadus | 18. Scobey |
| 5. Browning | 19. Sidney |
| 6. Chinook | 20. Sunburst |
| 7. Choteau | 21. Superior |
| 8. Columbus | 22. Thompson Falls |
| 9. Drummond | 23. Three Forks |
| 10. Dutton | 24. Troy |
| 11. Fairview | 25. Twin Bridges |
| 12. Joliet | 26. Virginia City |
| 13. Jordan | 27. Whitehall |
| 14. Lima | 28. White Sulphur Springs |

Proposed Activities 1979 FY:

All city plats will be updated as usual. The plan is to produce a new city-vicinity plat for each of as many of the remaining incorporated cities as possible.

Estimated Costs:

Programmed 1978 FY	\$ 8,000
Estimated Expenditures 1978 FY	\$12,000
Estimated Cost 1979 FY	\$18,000

MAPPING (Con't)

City Photography (Volume 3, Chapter IV)
Item P-14

Objectives:

To provide current aerial photography for all cities in the State as required for advanced planning.

Accomplishments 1978 FY:

Aerial photography was obtained for twelve urban areas and for fourteen of our smaller incorporated cities where there was some indication of growth.

Proposed Activities 1979 FY:

Incorporated cities and urban areas will be photographed as required for advanced city planning, delineation of urban areas, etc.

It is also planned to continue aerial photography of all cities that have had major changes due to growth or new highway construction.

Estimated Costs:

Programmed 1978 FY	\$ 3,000
Estimated Expenditures 1978 FY	\$ 2,000
Estimated Costs 1979 FY	\$ 3,000

MAPPING (Con't)

Special Mapping (Volume 3, Chapter V)
Item P-15

Objectives:

To produce special maps for specific purposes such as maps for weekly road reports, maps showing restrictive clearances on structures, land use maps, rest area information maps, traffic flow maps, etc.

Accomplishments 1978 FY:

A scenic route map was developed and drafted for installing in several rest areas. Special maps showing sufficiency ratings on the realigned F.A. Primary System were drafted. New F.A. Systems both Primary and Secondary mileposts and project maps were drafted. New F.A. Primary and Secondary Traffic Flow maps showing 1976 traffic were drafted.

Proposed Activities 1979 FY:

Activities in this area will be substantially the same as last fiscal year. State milepost, F.A. Primary and Secondary Project Number maps will be updated. Rest area maps will be developed and revised as required by our construction program and special maps for various studies will be produced as required.

Estimated Costs:

Programmed 1978 FY	\$ 4,000
Estimated Expenditures 1978 FY	\$ 3,000
Estimated Costs 1979 FY	\$ 6,000

TRAFFIC

Traffic Counting (Volume 4, Chapter I)
Item P-16 Volume and Vehicle Classification Counts

Objectives:

To obtain current traffic volumes and vehicle classification data on all classified highways and streets on a statewide basis. Data collected are used in the location and design of highways and are furnished to the public upon request.

Accomplishments 1978 FY:

Vehicle mile estimates were made for all sections of the Federal-aid system and estimates of vehicle miles by system were made for 1977 TA-1 Tables. Various types of traffic data were furnished to the Preconstruction Bureau for projects in the design stage and to the general public for various purposes.

The annual Traffic by Sections Report for 1977 on the Federal-aid systems was produced from traffic data obtained for this calendar year of 1977.

Manual classification counts were taken at approximately 125 major junctions seasonally on the Primary and Secondary Systems. Vehicle volume counts were taken in approximately 72 incorporated towns of less than 5,000 population. Vehicle volume counts were taken on the FAU Routes in the thirteen urban cities. Vehicle volume counts were obtained on the Primary and Secondary Systems.

Fifteen new portable counters were purchased at a cost of \$10,725. One counter was extensively damaged.

Proposed Activities 1979 FY:

Classification counts on the Federal-aid system will be taken

Item P-16 Continued

seasonally at approximately 130 locations. Vehicle volume counts will continue as in the past.

Vehicle mile estimates will be made for all systems and the annual Traffic by Sections will be prepared and distributed.

Volume counts will be taken in approximately six of our urban areas.

It is planned to implement a number of changes in our traffic counting program during the fiscal year based on the needs of supplying traffic users sufficient traffic data for their needs. The program will emphasize more on the Functional Classification System rather than the Federal-aid System. There is to be coordination with other agencies involved in traffic counting. There is also a desire to develop some traffic computer programs in compiling and storing traffic data as it is received from the field.

It is planned to purchase fifteen portable traffic counters at a cost of \$15,000 to replace those that are outdated and not repairable.

Estimated Costs:

Programmed 1978 FY	\$170,000
Estimated Expenditures 1978 FY	\$170,000
Estimated Costs 1979 FY	\$180,000
Equipment	(\$ 15,000)

TRAFFIC (Con't)

Traffic Counting (Volume 4, Chapters I, II, and III)
Item P-17 Permanent Traffic Recorders

Objectives:

To obtain accurate hourly traffic patterns at various locations throughout the State for use in developing expansion factors for coverage counts, design hour volumes and traffic volume trends.

Accomplishments 1978 FY:

Forty-four permanent counters were in operation the greater portion of the year and the data collected were analyzed to produce expansion factors for short term counts. Preconstruction was provided design hour volume for projects in the design stage.

One permanent counter located on a four lane interstate highway was converted from magnetic to loop detection. One location on a four lane interstate was taken out of service because of worn out equipment.

Equipment has been ordered for replacement of three locations, one being the above mentioned.

Locations received service calls every three to four months and a-proximately 125 calls were made to repair or replace equipment.

Monthly annual reports and a report on traffic volume trends and design hour volumes at each location were published during the year.

Proposed Activities 1979 FY:

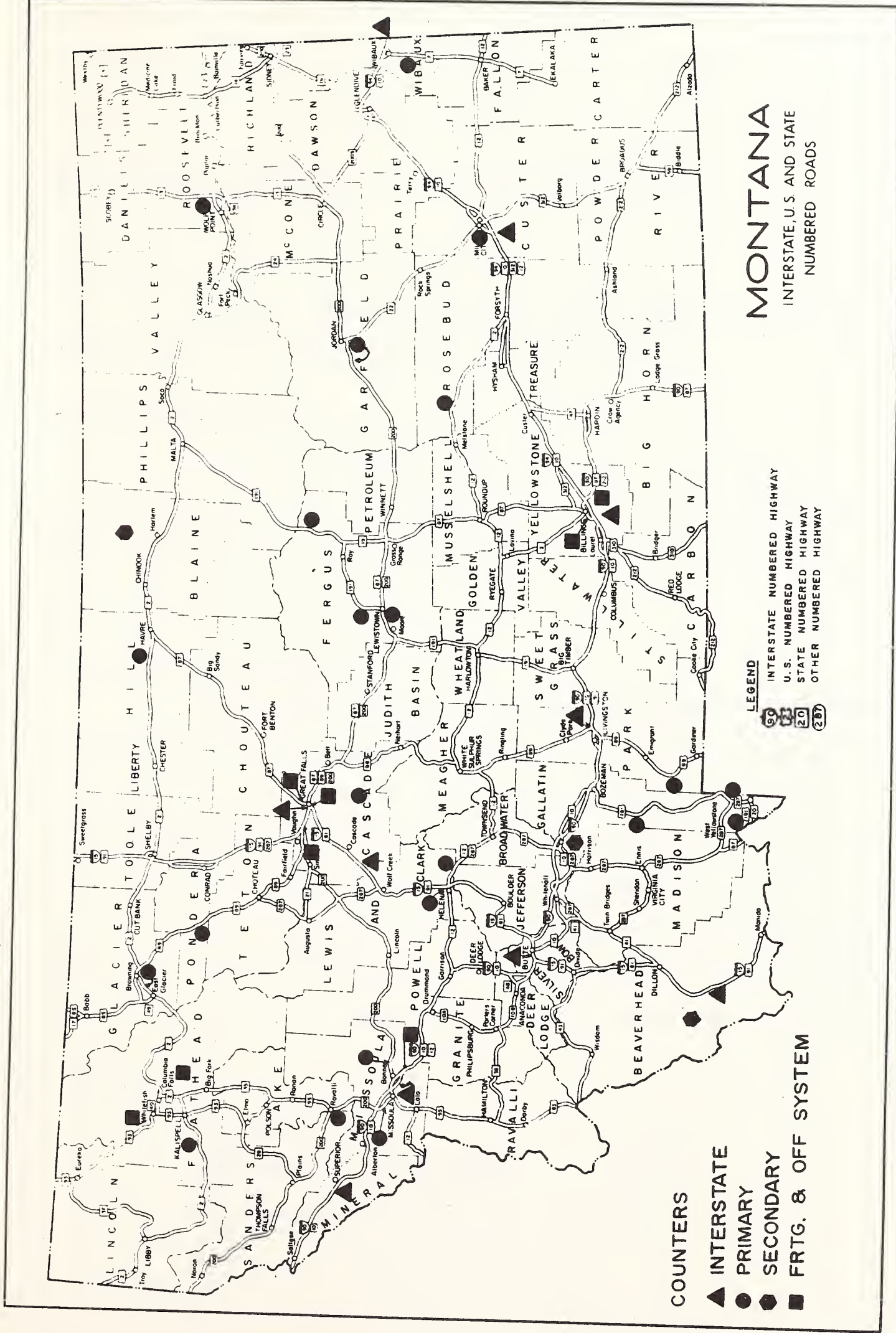
It is planned to operate at the minimum of 44 permanent counter locations and to analyze the resulting data which will include monthly and

annual reports.

The permanent traffic recorder locations will continue to be evaluated to determine if they are providing sufficient data to meet our needs. Alternate locations for ATR's will be studied if there is a need for additional traffic data. It is proposed to purchase 12 new units or recorders and detectors to replace obsolete and worn out equipment. Equipment removed will be salvaged if possible and located on lower traffic volume roads.

Estimated Costs:

Programmed 1978 FY	\$33,000
Estimated Expenditures 1978 FY	\$44,000
Estimated Costs 1979 FY	\$66,000
Equipment	(\$20,000)



MONTANA

INTERSTATE, U.S. AND STATE
NUMBERED ROADS

TRAFFIC (Con't)

Vehicle Weight and Characteristics (Volume 4, Chapter III)
Item P-18 Loadometer Survey

Objectives:

To secure information on truck loading trends to be used in pavement design and in developing state truck regulations.

Accomplishments 1978 FY:

Manual classification counts were taken for 24 hours at 20 stations on the Interstate and Primary Systems. Three stations, one on the Primary Urban Extension, one on the Urban and one of the Secondary were counted for a 16 hour period.

Proposed Activities 1979 FY:

Truck weight data will be collected at 23 stations throughout the State. Trucks will be weighed for a 16 hour period at 22 stations and one station for a 24 hour period. Manual classification counts will be taken for 24 hours at all stations. It is anticipated that 4 of the 24 hour manual counts will include the categorization of trucks for noise and air quality purposes. Trucks will be defined as medium weight gas or diesel powered and heavy weight gas or diesel powered. All data will be coded and cards punched, edited and submitted to the Federal Highway Administration for tabulation.

Estimated Costs:

Programmed 1978 FY	\$12,000
Estimated Expenditures 1978 FY	\$12,000
Estimated Costs 1979 FY	\$32,000

HIGHWAY STATISTICS

Mileage (Volume 5, Chapter I)
Item P-19 Road Log, State and Local Mileage Tables

Objectives:

To provide factual information on the extent of the physical highway plant and trends in system development, system improvement and rates of progress.

The Federal aid Road Log and the State and Local Mileage tabulations are recognized as the official mileage records for all systems.

Accomplishments 1978 FY:

The Federal aid routes were reviewed and revised as necessary to reflect changes caused by realignment and construction. The Federal Aid Road Log was produced by computer to reflect those changes as of December 31, 1977.

State mileage tables showing the status of each Federal aid System and the changes that occurred during the year were produced by computer methods using both the old reporting method and portions of the new reporting procedures.

The PR-511 diagrams showing the status of the Interstate System were revised periodically and distributed.

Local Mileage tables showing essentially the same information as the State mileage tables were compiled and published. These tables are used extensively in allocating funds to the local jurisdictions.

Proposed Activities 1979 FY:

Review and revise the road log and reference post data as necessary to reflect changes by route revisions and construction.

Item P-19 Continued

Publish the Forest Highway report, state mileage tables, and the certified mileage reports for use by various State and Federal agencies.

It is also planned to develop or revise existing IBM programs in order to comply fully with the new procedures for mileage reporting.

Estimated Costs:

Programmed 1978 FY	\$70,000
Estimated Expenditures 1978 FY	\$60,000
Estimated Cost 1979 FY	\$60,000

HIGHWAY STATISTICS (Con't)

Motor Vehicles, Operators and Fuels (Volume 5, Chapter II)
Item P-20

Objectives:

To assemble statistics on motor vehicle registrations, motor vehicle operators and fuel consumption. These data are used in determining highway user tax yields and vehicle and fuel tax policies.

Accomplishments 1978 FY:

Statistics on motor fuel consumption were compiled and reported on a monthly and annual basis. Statistics on motor vehicle registrations and motor vehicle operators were compiled on an annual basis.

Proposed Activities 1979 FY:

Activities for 1979 FY will be substantially the same as for 1978.

Estimated Costs:

Programmed 1978 FY	\$ 4,000
Estimated Expenditures 1978 FY	\$ 4,000
Estimated Cost 1979 FY	\$ 5,000

HIGHWAY STATISTICS (Con't)

State and Local Finance (Volume 5, Chapter III)
Item P- 21

Objectives:

To obtain pertinent financial statistics on highway taxation and disbursements for highway purposes from State and local road building agencies.

These statistics are used frequently in answering questions posed by legislators and highway administrators concerning State and local road financing.

Accomplishments 1978 FY:

Annual reports covering finances of State and local road building agencies were compiled and published. Completed questionnaires from the cities and counties were used to obtain the local financial data.

Proposed Activities 1979 FY:

Financial data for State and local road building agencies will be compiled and published as usual.

Estimated Costs:

Programmed 1978 FY	\$ 8,000
Estimated Expenditures 1978 FY	\$ 8,000
Estimated Cost 1979 FY	\$ 9,000

ECONOMIC AND FISCAL

Straight Line Diagrams (Volume 6, Chapter I)
Item P- 22

Objectives:

To present a visual historical record of highway construction on a diagram showing all major features for all projects on the Federal-aid Systems.

Accomplishments 1978 FY:

Straight line diagrams were revised to reflect changes due to new construction or maintenance betterments and a number of the older diagrams were completely redrawn. One draftsman has been assigned to this project.

Proposed Activities 1979 FY:

Straight line diagrams will be revised or redrawn to reflect the latest as built construction plans. Many of the straight line diagrams presently on the old scale will be redrawn to the new scale.

Estimated Costs:

Programmed 1978 FY	\$12,000
Estimated Expenditures 1978 FY	\$16,000
Estimated Cost 1979 FY	\$16,000

ECONOMIC AND FISCAL (Con't)

Construction Cost Data and Cost Indices (Volume 6, Chapter II) Item P-23

Objectives:

To provide detailed information on the unit costs and quantities of materials on all highway and bridge projects let to contract. Costs of selected items are then related to comparable costs during a base period to compile a cost index for the State.

Accomplishments 1978 FY:

The annual contract analysis report was compiled and published and the construction cost index report was compiled and published on a semi-annual basis.

Proposed Activities 1979 FY:

Activity on this project will be substantially the same as in FY 1978.

Estimated Costs:

Programmed 1978 FY	\$ 6,000
Estimated Expenditures 1978 FY	\$ 6,000
Estimated Cost 1979 FY	\$ 6,000

STATEWIDE TRANSPORTATION PLANNING

Statewide Transportation Planning Process (Volume 7, Chapter I)
Item P-24

Objectives:

To finance the statewide transportation planning activities that cannot be charged to specific projects.

Accomplishments 1978 FY:

None. This is a new project.

Proposed Activities 1979 FY:

It is proposed to finance the salaries of employees working on the statewide transportation planning process that cannot be charged to a specific project. This element will be defined prior to any work being undertaken.

Estimated Costs:

Programmed 1978 FY	-0-
Estimated Expenditures 1978 FY	-0-
Estimated Costs 1979 FY	\$5,000

STATEWIDE TRANSPORTATION PLANNING (Con't)

Continuing Needs Estimate (Volume 7, Chapter II)
Item P- 25

Objectives:

To establish a continuing highway needs study which will provide an accurate and immediately available estimate of construction needs on the Federal-aid Primary and major collector systems for planning, programming and budgeting purposes.

Accomplishments 1978 FY:

A computer program was in the planning stage for the Continuing Needs Estimate. Research was conducted into programs used by others, in order to determine methods and procedures. The program to be developed will be adaptable to all Federal aid Systems.

Proposed Activities 1979 FY:

It is planned to complete the needs estimate program making full use of the Highway Information System. Personnel will be assigned to compiling and coding the required data.

Estimated Costs:

Programmed 1978 FY	\$20,000
Estimated Expenditures 1978 FY	\$ 4,000
Estimated Costs 1979 FY	\$20,000

STATEWIDE TRANSPORTATION PLANNING (Con't)

Sufficiency Ratings (Volume 7, Chapter III)
Item P- 26

Objectives:

To obtain factual data on the relative sufficiency of the Federal-aid Primary System for use in allocating construction funds and in long range priority planning.

Accomplishments 1978 FY:

A field inspection was made and sufficiency ratings computed on a section by section basis on the Federal-aid Primary System.

The 1976 annual report was published using traffic accident and road log data stored in the Highway Information System.

Proposed Activities 1979 FY:

Activities under this item will be substantially the same as in the previous year.

Estimated Costs:

Programmed 1978 FY	\$28,000
Estimated Expenditure 1978 FY	\$25,000
Estimated Costs 1979 FY	\$30,000

STATEWIDE TRANSPORTATION PLANNING (Con't)

F.A. Systems and Highway Functional Classification Revisions (Volume 7, Chapter IV
Item P-27

Objectives:

To process all requested F.A. Systems and Functional Classification revisions within the state. Includes collecting supporting data, preparing submissions to Highway Commission and Federal Highway Administration, and notification of approvals to interested parties. To maintain HIS files to reflect current status.

Accomplishments 1978 FY:

None. This study was not proposed for funding in 1978; however there is a need for continuing this project.

Proposed Activities 1979 FY:

It is planned to code the functional classification of all non-Federal aid rural roads into the Highway Information System.

To process all requested F.A. Systems and Functional Classification revisions.

Estimated Costs:

Programmed 1978 FY	-0-
Estimated Expenditures 1978 FY	-0-
Estimated Costs 1979 FY	\$10,000

STATEWIDE TRANSPORTATION PLANNING (Con't)

Project Control and Programming (Volume 7, Chapter V)
Item P-28

Objectives:

To establish and maintain a realistic six year construction program for the Federal-aid systems and to schedule projects for contract in an orderly manner.

Accomplishments 1978 FY:

The six year construction programs were updated for the Federal-aid systems by financial districts and urban areas of over 5,000 population.

The status of program funding was constantly updated so that projects could be scheduled for contract in an orderly manner.

Proposed Activities 1979 FY:

It is planned to finance only those activities in the Project Control Section that are directly related to project development.

Estimated Costs:

Programmed 1978 FY	\$15,000
Estimated Expenditures 1978 FY	\$15,000
Estimated Costs 1979 FY	\$10,000

STATEWIDE TRANSPORTATION PLANNING (Con't)

Program Development (Volume 7, Chapter VI)
Item P-29

Objectives:

To develop and implement on a continuing basis a highway improvement program including logical and comprehensive procedures for the selection, construction, and evaluation of highway improvements and safety projects, on all highways, with the specific objectives of selecting areas for improvements demonstrating the greatest need, and reducing the number and severity of accidents. Also to continue the surveillance of high accident areas involved with narrow bridges, intersections, clusters of accidents, etc. We are going to develop a data program to be able to locate high hazard locations by accident rate and severity rate.

Accomplishments 1978 FY:

Procedures were improved to evaluate, and analyze data to establish project priorities for various categories of funding. Using planning tools available such as Sufficiency Ratings, Needs Studies, Bridge Inspection Reports, Traffic by Section, Photo Logs, Road Logs, Roadside Obstacle Inventory, Railroad Crossing Inventory, Skid Resistance Inventory and Field Reviews. Priorities were developed along with the data for Federal aid highway programs initiated by the State Department of Highways.

A Statewide priority listing of railroad crossing improvement needs was developed for both on and off system railroad crossings. As we were doing the priority listing it became apparent that both off and on system inventory crossings needed to be updated. The on system reinventory has been completed and the off system reinventory will be completed this year. From the lists, on system and off system projects were programmed. Evaluation

studies of completed safety projects were conducted, on projects which had sufficient data to be meaningful.

Approximately 56 high accident areas were pin pointed from 5 years of accident records. Each one was field investigated to determine whether road geometrics were causing the accidents, then corrective measures were determined, and a cost benefit analysis made. Those with highest benefit-cost ratio were programmed for improvements.

Proposed Activities 1979 FY:

Continue to improve methods of evaluating and prioritizing needs information for highway construction projects. To supply statistics and information required by programmers when developing Federal-aid Programs.

Evaluation studies of completed safety projects will be accomplished.

We will attempt to develop a data program which will identify high hazard accident locations via accident rates and severity rates.

Estimated Costs:

Programmed 1978 FY	\$ 90,000
Estimated Expenditures 1978 FY	\$112,000
Estimated Costs 1979 FY	\$115,000

Planning Data Bank (Volume 7, Chapter VII)
Item P- 30

Objectives:

To develop a computerized system of storage and retrieval of planning data pertaining to traffic, Federal-aid road log, accidents, sufficiency ratings, structures, etc.

Accomplishments 1978 FY:

The Highway Information System was maintained in house during the year. The No Passing Zone data was collected and computer programs written to summarize and store all data collected. A computer program was written to summarize roadway environment data according to the new FHWA Guide For Mileage Facilities Reporting.

Proposed Activities 1979 FY:

It is planned to maintain the Highway Information System and write or revise any necessary programs. Computer programs will be written to summarize the rural county roads data according to the latest FHWA Guide for Mileage Facilities Reporting. It is also proposed that a joint effort will be undertaken with other Department of Highway Bureaus to look at the feasibility of computerizing a maintenance by milepost system.

Estimated Costs:

Programmed 1978 FY	\$30,000
Estimated Expenditures 1978 FY	\$18,000
Estimated Costs 1979 FY	\$25,000

STATEWIDE TRANSPORTATION PLANNING (Con't)

Reference Marker Revisions (Volume 7, Chapter VIII)
Item P-31

Objectives:

Update the status of reference markers on Federal aid routes in accordance with required alignment of these routes for use in the HIS System.

Accomplishments 1978 FY:

Reference markers have been placed on approximately 1,578 miles of the more important paved secondary routes.

An update has been completed on Federal-aid routes that were previously posted with reference markers.

Proposed Activities 1979 FY:

Install reference markers on 500 miles of paved Secondary Routes to complete this program.

Estimated Costs:

Programmed 1978 FY	\$35,000
Estimated Expenditures 1978 FY	\$35,000
Estimated Costs 1979 FY	\$ 5,000

STATEWIDE TRANSPORTATION PLANNING (Con't)

Origin and Destination Studies - Rural (Volume 7, Chapter IX)
Item P-32

Objectives:

To obtain factual data on current use of highways in relation to the origin and destination of vehicle trips. These data will be used in the location of new routes or the relocation of existing routes.

Accomplishments 1978 FY:

No origin and destination studies were conducted during FY 1978.

Proposed Activities 1979 FY:

It is proposed to conduct small origin and destination studies as the need becomes apparent and as requested by the Preconstruction Bureau.

A brief description of the need for a study of this type and a general description of how the work is to be accomplished will be submitted to the Federal Highway Administration Division Office for approval before each survey is started.

Estimated Costs:

Programmed 1978 FY	\$10,000
Estimated Expenditures 1978 FY	\$ -0-
Estimated Costs 1979 FY	\$10,000

STATEWIDE TRANSPORTATION PLANNING (Con't)

Special Traffic Studies (Volume 7, Chapter X)
Item P-33

Objectives:

To provide whatever traffic data is required for special purposes by the highway planner, designer or administrator. These special data are used to solve specific problems pertaining to school crossings, signalized intersections, etc.

Accomplishments 1978 FY:

A numerous amount of special traffic investigations were made in urban and rural areas on the Federal-aid and local roads and street systems throughout the state primarily to obtain special traffic data for design purposes. These studies included the collection of traffic data for school crossing justification, channelization and signals.

Proposed Activities 1979 FY:

It is planned to provide necessary traffic information as required throughout the year for special situations.

Estimated Costs:

Programmed 1978 FY	\$29,000
Estimated Expenditures 1978 FY	\$21,000
Estimated Costs 1979 FY	\$25,000

URBAN TRANSPORTATION PLANNING

Urban Transportation Overhead (Volume 8, Chapter I)
Item P-34

Objectives:

To finance general urban transportation administrative activities that cannot be charged to specific projects.

Accomplishments 1978 FY:

Portions of the urban transportation supervisor's salary that could not be charged specifically to an urban transportation project were financed under this item. Also included was a portion of the urban transportation sections salary for a secretary, costs associated with the library staff instruction costs, urban area planning activities not having a project account and some supplies and materials for the urban transportation section that could not be separately identified were also financed.

Proposed Activities 1979 FY:

It is anticipated that the proposed activities and costs under this item will substantially increase in order to reflect general overhead urban transportation administrative function costs. Included are overhead costs associated with (1) staff instruction such as seminars, conferences, schools, etc.; (2) small urban areas planning not included under a specific program; (3) miscellaneous planning activities not included under a specific program; (4) land use impact evaluation and (5) library maintenance.

Estimated Costs:

Programmed 1978 FY	\$ 6,000
Estimated Expenditures 1978 FY	\$12,000
Estimated Costs 1979 FY	\$65,000

URBAN TRANSPORTATION PLANNING (Con't)

Continuing Planning-Billings (Volume 8, Chapter II)
Item P-35

Objectives:

To develop and maintain an effective program for continuing transportation planning in the Billings urban area in cooperation with the local jurisdictions. This continuing planning process will be responsive to the changes in needs of the community as evidenced by changes in land use, travel patterns, air quality, etc. Current data concerning land use, travel and transportation facilities will be maintained to allow periodic reevaluation of the transportation plan as conditions change from those initially analyzed and forecasted.

Accomplishments 1978 FY:

The accomplishments of the continuing transportation planning process for the Billings study area basically amounted to maintaining the process and with the completion of the Level II Update, a final document will be provided in the near future. Details of the accomplishments will be contained in the forthcoming application for certification.

Proposed Activities 1979 FY:

The unified work program, which is being submitted as a separate document, details the proposed activities for the 1979 FY. A description of each proposed item and detailed cost estimate is included in the unified work program.

Item P-35 Continued

Estimated Costs:

	<u>HPR</u>	<u>PL</u>	<u>Total</u>
Programmed 1978 FY	\$15,000	\$122,160	\$137,160
Estimated Expenditures 1978 FY	\$15,000	\$110,000	\$125,000
Estimated Costs 1979 FY	\$15,000	\$124,740	\$139,740
Contract	-----		

URBAN TRANSPORTATION PLANNING (Con't)

Continuing Planning-Great Falls (Volume 8, Chapter III)
Item P-36

Objectives:

To develop and maintain an effective program for continuing transportation planning in the Great Falls urban area in cooperation with the local jurisdictions. This continuing planning process will be responsive to the changes in needs of the community as evidenced by changes in land use, travel patterns, etc. Current data concerning land use, travel and transportation facilities will be maintained to allow periodic reevaluation of the transportation plan as conditions change from those initially analyzed and forecast.

Accomplishments 1978 FY:

The accomplishments of the continuing transportation planning process for the Great Falls study area basically amounted to maintaining the process. Work continued on the Level II Update with service related work being done for various project reevaluations within the study area. Details of the process will be contained in the forthcoming application for certification.

Proposed Activities 1979 FY:

The proposed activities for the fiscal year 1979 are detailed in the unified work program which is being submitted as a separate document. The unified work program provides a detailed cost estimate for all planning operations and for each work element anticipated in the Great Falls area.

Item P-36

Estimated Costs:

	<u>HPR</u>	<u>PL</u>	<u>Total</u>
Programmed 1978 FY	\$16,250	\$92,000	\$108,250
Estimated Expenditures 1978 FY	\$16,250	\$90,000	\$106,250
Estimated Costs 1979 FY	\$16,250	\$92,000	\$108,250
Contract	----		

URBAN TRANSPORTATION PLANNING (Con't)

Helena Urban Transportation Study (Volume 8, Chapter IV)
Item P-37

Objectives:

To develop and maintain an effective program for continuing transportation planning in the Helena urban area in cooperation with the local jurisdiction. This continuing planning process will be responsive to the changes in the needs of the community as evidenced by changes in land use, travel patterns, etc.

Accomplishments 1978 FY:

Achievements of the transportation planning process for the Helena urban area consisted of providing considerable services relative to local assessment of (1) a southside community bypass route; (2) planning and design problems associated with the intersection of Montana, Helena and Lyndale Avenues and (3) planning and design problems with respect to the intersection of Helena, Neil and Last Chance Gulch. Other substantial undertakings included the re-organization and establishment of bylaws by the transportation committees along with preparation of a locally agreed upon prospectus document for updating the Helena Transportation Plan.

The Technical Advisory Committee met approximately once each month providing technical assistance to the Policy Coordinating Committee in maintaining an effective long and short range construction program for the urban area. The TAC developed and recommended to the Policy Coordinating Committee a prospectus for the update of the current transportation plan and adopted a set of urban transportation process bylaws for the Technical Advisory Committee.

The Policy Coordinating Committee met as necessary to approve long and short range construction priorities and system revisions. The PCC revised the Memorandum of Agreement for continuing transportation planning to more effectively define the cooperative planning effort between the responsible agencies. This agreement and a set of Policy Coordinating Committee bylaws were adopted by the Committee. A prospectus for the update of the current transportation plan, recommended by the Technical Advisory Committee, was approved by Policy and submitted to the Federal Highway Administration for subsequent approval.

Proposed Activities 1979 FY:

The Policy and Technical Advisory Committees, as established in the cooperative agreement, will meet as necessary to carry on the work of the continuing transportation planning process. An update of the current transportation plan will commence once the Federal Highway Administration approves the prospectus of the update. Work will consist mainly of updating socio-economic characteristics for the urban area and developing a future street network and traffic projections.

Estimated Costs:

Programmed 1978 FY	\$20,000
Estimated Expenditures 1978 FY	\$19,000
Estimated Costs 1979 FY	\$30,000

URBAN TRANSPORTATION PLANNING (Con't)

Miles City Urban Transportation Study (Volume 8, Chapter V)
Item P- 38

Objectives:

To develop and maintain an effective program for continuing planning in the Miles City urban area in cooperation with the local governmental agencies and in accordance with the procedures outlined in the FHPM - Vol. 4, Chap. 4, Sec. 2, modified to fit smaller urban area requirements.

Accomplishments 1978 FY:

Preliminary engineering and related studies necessary in the development of the projects programmed for the urban area continued in an effort to advance these projects, based on established priorities, through design and construction.

Proposed Activities 1979 FY:

Due to the size of the city, it is anticipated that there will not be much activity in the continuing phase. Service will be provided to the community as necessary in cooperation with local authorities. Meetings will be held with local officials as necessary to establish project priorities or consider any matters that may be pertinent to the continuing transportation planning process.

Estimated Costs:

Programmed 1978 FY	\$1,000
Estimated Expenditures 1978 FY	\$ 800
Estimated Costs 1979 FY	\$2,600

URBAN TRANSPORTATION PLANNING (Con't)

Butte Urban Transportation Study (Volume 8, Chapter VI)
Item P-39

Objectives:

To maintain a comprehensive transportation planning program for the Butte urban area in cooperation with the local governmental agencies and in accordance with the procedures outlined in the FHPM - Vol. 4, Chap. 4, Sec. 2 modified urban area requirements.

Accomplishments 1978 FY:

The Butte Technical Advisory Committee met periodically to discuss and resolve minor problems affecting the transportation planning process in the urban area. This Committee re-established its project priorities in light of the U.S. 91 Abandonment and other community changes. The Policy Coordinating Committee met to approve the construction programs as recommended by TAC and adopted a revised memorandum of agreement as a result of changing to a new form of government.

Proposed Activities 1979 FY:

The Technical Advisory and Policy Coordinating Committees as established by agreement will meet periodically to resolve any urban transportation problems in Butte. Presently being considered is a minor update of the Butte Transportation Plan. The Policy Coordinating Committee will determine whether any plan revision is in order and will delegate the responsibility for updating or collecting the necessary data. Any work connected with the revision of the adopted plan will be submitted to the Federal Highway Administration Division Office for approval before initiating.

Item P-39 Continued

Estimated Costs:

Programmed 1978 FY	\$ 5,000
Estimated Expenditures 1978 FY	\$ 7,000
Estimated Costs 1979 FY	\$20,500

URBAN TRANSPORTATION PLANNING (Con't)

Anaconda Traffic Study (Volume 8, Chapter VII)
Item P-40

Objectives:

To develop and maintain an effective program for continuing planning in the Anaconda urban area in cooperation with local officials.

Accomplishments 1978 FY:

Assistance was provided to local officials in the re-establishment of priorities for improvements on the FA Urban System. At the request of local officials three urban projects have been programmed for construction.

Proposed Activities 1979 FY:

It is planned to provide service to the community in cooperation with the local planning agencies in matters pertaining to the traffic study or any transportation problems that may develop during the year.

Estimated Costs:

Programmed 1978 FY	\$ 1,000
Estimated Expenditures 1978 FY	\$ 900
Estimated Costs 1979 FY	\$ 1,700

URBAN TRANSPORTATION PLANNING (Con't)

Missoula Update (Volume 8, Chapter VIII)
Item P- 41

Objectives:

To update the Missoula Urban Transportation Plan in cooperation with local governmental agencies and in accordance with procedures outlined in the FHPM - Vol. 4, Chapt. 4, Sec. 2, modified to fit smaller urban area requirements.

Accomplishments 1978 FY:

Various alternates for updating the 1965 plan were selected for testing by the Technical Advisory Committee. Future traffic assignments were made to these alternates and the alternates were evaluated.

A public meeting was held to discuss the proposed alternates and to receive public input in the planning process.

Final selection of alternates for the update transportation plan were made and a summary report containing a long range and short range program was written.

Proposed Activities 1979 FY:

The summary report will be published and distributed. Meetings will be held with local officials to obtain the necessary approvals for the updated transportation plan.

The Technical Advisory and Policy Coordinating Committees will meet as necessary during the year.

The Missoula City County Planning Board will be subsidized in the amount of \$8,000 to help finance a local transportation planner.

Estimated Costs:

Programmed 1978 FY	\$25,000
Estimated Expenditures 1978 FY	\$25,000
Estimated Costs 1979 FY	\$20,800

URBAN TRANSPORTATION PLANNING (Con't)

Bozeman Urban Transportation Study (Volume 8, Chapter IX)
Item P-42

Objectives:

To develop a comprehensive transportation plan for the Bozeman urban area in cooperation with the local governmental agencies and in accordance with the procedures outlined in the FHPM -Vol. 7, Chap. 4, Sec. 2, modified to fit smaller urban area requirements.

Accomplishments 1978 FY:

A prospectus for a transportation study for the Bozeman urban area was developed in cooperation with the local officials and approved by the Federal Highway Administration. The necessary agreements, TAC and PCC Bylaws have been locally adopted. An external origin-destination survey, additional traffic counts, speed and delay studies, traffic analyses zones and link node map for assigning purposes has been completed.

Proposed Activities 1979 FY:

All necessary field work will be completed and the analyses started. Continue the Bozeman urban transportation study developing the trip generation, trip destination, traffic assignment and plan aspects of the program.

Estimated Costs:

Programmed 1978 FY	\$30,000
Estimated Expenditures 1978 FY	\$38,000
Estimated Costs 1979 FY	\$35,000

SPEED AND TRAFFIC SERVICE STUDIES

Speed Studies (Volume 9, Chapter I)
Item P-43

Objectives:

To determine normal speed distribution and speed trends by vehicle type at selected locations throughout the state. The results are used by the Federal Highway Administration, State administrators and legislators.

Accomplishments 1978 FY:

From July 1 to June 30, 1978, 64 stations located statewide were monitored for speeds.

Quarterly reports and a yearly report were submitted to the Federal Highway Administration.

A computer program was developed for compiling speed data into quarterly reports and a yearly report.

Proposed Activities 1979 FY:

Approximately 64 stations statewide will be monitored in accordance with our approved speed monitoring program.

A quarterly and yearly report will be prepared and distributed as necessary.

Estimated Costs:

Programmed 1978 FY	\$15,000
Estimated Expenditures 1978 FY	\$15,000
Estimated Costs 1979 FY	\$15,000

SPEED AND TRAFFIC SERVICE STUDIES (Con't)

Accident Studies (Volume 9, Chapter II)
Item P-44

Objectives:

To provide factual data on the location, number and type of traffic accidents to other divisions of the Department of Highways and the general public. These data are used in identifying high accident locations and in designing improvement at these locations.

Accomplishments 1978 FY:

The Traffic Accident Unit in the Montana Highway Patrol was subsidized in the amount of \$30,260.

The TA-1 tabulation was compiled and transmitted. An Accident by Section tabulation was compiled for departmental use only, not for distribution. New county maps showing the F.A. Systems with mileposts were prepared for the Accident Section in the Highway Patrol.

Proposed Activities 1979 FY:

The Traffic Accident Unit located in the State Highway Patrol will be subsidized in the amount of \$31,800.

The TA-1 tabulation will be compiled as usual. An Accident by Section tabulation will also be compiled for departmental use. The Accident Section of the Highway Patrol will be kept posted on the F.A. Systems and other highway changes as well as being provided current maps, etc.

Item P-44 Continued

Estimated Costs:

Programmed 1978 FY	\$33,000
Estimated Expenditures 1978 FY	\$34,000
Estimated Costs 1979 FY	\$37,000
Contract	\$31,800

SPECIAL STUDIES (Con't)

Colstrip Energy Development Area Transportation Study (Volume 10, Chapter I)
Item P-45

Objectives:

To determine the current and projected needs of the highway network within the study area. To develop a Technical Advisory Committee that can provide technical input in the development of the study and provide a communications link with agencies involved and the general public.

Accomplishments 1978 FY:

It is anticipated that the field inventory will be complete and all existing pertinent data concerning roadway assembled by June 30, 1978. Also the establishment of a steering committee to develop plans to analyze data that comes up for review.

Proposed Activities 1979 FY:

It is anticipated that once all data is assembled the objectives will be formulated and future conditions forecasted. The development of a plan and program compatible with the various sources of funding available to satisfy the existing and projected needs.

Estimated Costs:

Programmed 1978 FY	\$ 5,000
Estimated Expenditures 1978 FY	\$ 5,000
Estimated Costs 1979 FY	\$10,000

SPECIAL STUDIES (Con't)

Scenic Route Study (Volume 10, Chapter II)
Item P-46

Objectives:

To establish a "Scenic Route System" for the State of Montana, designated in the field and on the state tourist maps to aid motorists in selecting scenic routes to travel.

Accomplishments 1978 FY:

Twenty-two routes have been selected from the 70 routes proposed in the 1965 and 1974 studies as meeting the criteria for scenic routes. Four private citizens have been selected and have agreed to serve on the panel to review and rate the proposed routes.

Proposed Activities 1979 FY:

It is planned to have the panel field inspect the selected routes and rate them on a point system. Field data will be reviewed and scenic routes selected. Final recommendations made as to cost involved in signing and improving scenic route system.

Estimated Cost:

Programmed 1978 FY	\$25,000
Estimated Expenditures 1978 FY	\$ 5,000
Estimated Costs 1979 FY	\$15,000

SPECIAL STUDIES (Con't)

Projects Not Programmed (Volume 10, Chapter III)
Item P-47

Objectives:

To provide funding for studies that may be approved during
FY 1979.

Accomplishments 1978 FY:

This contingency item was used to provide funding for the
Scenic Route Study project. It was also used to balance overruns in other
projects during FY 1978.

Proposed Activities 1979 FY:

These funds will be used to finance additional small studies that
may be approved during the year after our 1978 work program is approved.

Estimated Costs:

Programmed 1978 FY	\$50,000
Estimated Expenditures 1978 FY	\$43,000
Estimated Costs 1979 FY	\$40,000

SUMMARY OF PLANNING ACTIVITIES - PART 1
 HPR-PL-(17)
 JULY 1, 1978 to JUNE 30, 1979

		<u>1979 FY ESTIMATED COST</u>
VOLUME 1	<u>ADMINISTRATION AND CONTROL</u>	\$ 86,000
	P-1 Program Management	86,000
VOLUME 2	<u>ROAD INVENTORY</u>	145,000
	P-2 Rural and Urban	60,000
	P-3 Bridge Records for Defense Requirements	18,000
	P-4 Railroad Crossing Hazard Rating	4,000
	P-5 Traffic Control Devices Inventory	8,000
	P-6 Photographic Inventory of FA Systems	22,000
	P-7 Skid Resistance Inventory of FA Systems	25,000
	P-8 No Passing Zone Inventory	1,000
	P-9 Photographic Inventory of Railroad Crossings	2,000
	P-10 Historic Bridges Inventory	5,000
VOLUME 3	<u>MAPPING</u>	106,000
	P-11 County Maps	61,000
	P-12 State Maps	18,000
	P-13 Incorporated City Plats	18,000
	P-14 City Photography	3,000
	P-15 Special Mapping	6,000
VOLUME 4	<u>TRAFFIC</u>	278,000
	P-16 Volume and Vehicle Classification Counts	180,000
	P-17 Permanent Traffic Recorders	66,000
	P-18 Loadometer Survey	32,000
VOLUME 5	<u>HIGHWAY STATISTICS</u>	74,000
	P-19 Road Log, State and Local Mileage Tables	60,000
	P-20 Motor Vehicles, Operators and Fuels	5,000
	P-21 State and Local Finance	9,000
VOLUME 6	<u>ECONOMIC AND FISCAL</u>	22,000
	P-22 Straight Line Diagrams	16,000
	P-23 Construction Cost Data and Cost Indices	6,000

1979 FY
Estimated
Cost

VOLUME 7 STATEWIDE TRANSPORTATION PLANNING \$ 255,000

P-24	Statewide Transportation Planning Process	5,000
P-25	Continuing Needs Estimate	20,000
P-26	Sufficiency Ratings	30,000
P-27	Functional Classification Study and Systems Revision	10,000
P-28	Project Control and Programming	10,000
P-29	Program Development	115,000
P-30	Planning Data Bank	25,000
P-31	Reference Marker Revision	5,000
P-32	Origin & Destination Studies-Rural	10,000
P-33	Special Traffic Studies	25,000

VOLUME 8 URBAN TRANSPORTATION STUDY 431,610

P-34	Urban Transportation Overhead	65,000
P-35	Continuing Planning-Billings	139,740
P-36	Continuing Planning-Great Falls	108,250
P-37	Helena Urban Transportation Study	30,000
P-38	Miles City Transportation Study	2,600
P-39	Butte Urban Transportation Study	20,500
P-40	Anaconda Traffic Study	1,700
P-41	Missoula Update	28,800
P-42	Bozeman Traffic Study	35,000

VOLUME 9 SPEED AND TRAFFIC SERVICE STUDIES 52,000

P-43	Speed Studies	15,000
P-44	Accident Studies	37,000

VOLUME 10 SPECIAL STUDIES 65,000

P-45	Colstrip E.D.A. Transportation Study	10,000
P-46	Scenic Route Study	15,000
P-47	Projects Not Programmed	40,000

TOTAL PLANNING ACTIVITIES PART I	1,514,590
TOTAL CONTRACTS HPR-	(31,800)

Great Falls		Billings	
\$ 16,250	HPR	\$ 15,000	HPR
\$ 92,000	PL	\$124,740	PL
\$108,250		\$139,740	

TOTAL RESEARCH ACTIVITIES PART II *	\$ 174,250
TOTAL NON-PARTICIPATING PART III	\$ 5,100
TOTAL PROGRAM	\$1,693,940

ESTIMATE OF ACTIVITIES AND
EXPENDITURES OF PLANNING AND RESEARCH BUREAU
FOR PERIOD OF JULY 1, 1978 - JUNE 30, 1979

PROJECT HPR-PL-1(16)

PART II - RESEARCH AND DEVELOPMENT

A. IDENTIFICATION

Title: Administration of Research

State Project Number: 8200

Federal Designation: Type A Continuing Study

Research Organization: State of Montana, Department of Highways

Approval Date: July 1, 1978

B. PROPOSED WORK

1. To supervise and direct the Research and Development activities of the Department in finding solutions to unsolved problems through planning, conducting, reporting, and implementing results of research studies, experimental projects, demonstration projects, and evaluations.
2. To attend the annual Transportation Research Board meeting in Washington, D. C. and Federal Highway Administration research workshops.
3. To prepare the annual research work program.

C. BUDGET FOR FY 1979

Salaries	\$26,900
Materials	300
Travel	<u>1,800</u>
TOTAL	\$29,000

Part II

A. IDENTIFICATION

Title: Highway Research Board Membership and Correlation Service

State Project Number: 8500

Federal Designation: Type A Continuing Study

Research Organization: Transportation Research Board

Approval Date: July 1, 1978

B. PROPOSED WORK

To subscribe to the services rendered to all membership organizations.

1. To correlate all domestic and foreign research in highway related fields, print timely abstracts, administer special research workshops and to serve highway departments and AASHTO in their research efforts.
2. To administer a computer information service which each membership organization can interrogate for information about all available research in a given area.
3. To print and distribute detailed reports or research studies that are of immediate interest to most highway organizations.
4. To plan the National Transportation Research Board annual meeting in Washington, D. C.

C. BUDGET FY 1979

Subscription Price	\$24,700
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D. EXPENDITURES TO DATE

Expenditures for FY 1978	\$24,700
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E. IMPLEMENTATION ACCOMPLISHMENTS

- 1a. The computer service was used many times during FY 1978 and the monthly volumes of abstracts on current research problems were received.
- 1b. The Department of Highways received nearly 500 copies of special reports, special studies and papers on current research findings.

PART II - Continued

A. IDENTIFICATION

Title: Implementation

State Project Number: 7926

Federal Organization: Type A Continuing Study

Research Organization: State of Montana, Department of Highways

Approval Date: December 31, 1974

B. PROPOSED WORK

1. To review all incoming literature and reports (TRB, FHWA, research done by other states, etc.) and determine the value and applicability to Montana.
2. To demonstrate the value of new developments or techniques through experimental or field tests with cooperation from the various Divisions, Bureaus and/or industry.
3. To promote through publications, training, workshops or other appropriate means the implementation of the developments from research.
4. To plan and conduct a program of technology transfer.

C. BUDGET FOR FY 1979

Salaries	\$ 4,500
Travel	500
Equipment	-0-
TOTAL	\$ 5,000

PART II - Continued

A. IDENTIFICATION

Title: Drainage Area Flow

State Project Number: 8519

Federal Designation: Type A Continuing Study

Research Organization: U.S. Geological Survey

Approval Dates: First Approval 1954

Latest Revised Program 1973

B. PROPOSED WORK

1. To continue operation of crest-stage gages at 172 selected sites in Montana.
2. Make sufficient measurements of flow at each site to maintain a current stage-discharge relationship curve.
3. Determine the 1978 annual maximum flow at each site and approximate the date of occurrence.
4. Obtain peak flows at discontinued or miscellaneous sites that may be hydrologically significant to this program.
5. Publish the annual progress report to include data through September 30, 1978.

C. BUDGET FOR FY 1979 - July 1, 1978 through June 30, 1979

Salaries	\$33,600
Materials & Printing	\$450
Travel	\$12,000
Equipment	<u>\$10,450</u>
TOTAL	\$56,500
HPR Funds	\$23,150
Additional State Funds	\$5,100
U.S.G.S.	<u>\$28,250</u>
TOTAL	\$56,500

D. EXPENDITURES TO DATE

FY 1978 thru 4-1-7 ----- \$33,300

Estimate 4-1-78 to 6-30-78 ----- \$11,100

E. ACCOMPLISHMENTS DURING FY 1978

1. Operated and maintained a total of 160 stations east of the Continental Divide and 31 west of the Divide.
2. Determined the 1977 annual peak flows and published the 1977 basic data report.

A. IDENTIFICATION

Title: Predicting Moisture-Induced Damage to Asphaltic Concrete-
Field Evaluation Phase

State Project Number: 7928

Federal Designation: Type A Continuing Study

Research Organization: Montana Department of Highways

Coordinating Agency: University of Idaho

Approval Date: May 25, 1976

B. PROPOSED WORK

From a pre-selected paving project, samples of aggregate and asphalt will be secured during hot plant mixing and stored for future use. The above materials will be used to fabricate specimens for special conditioning and periodic testing. From the same project, pavement cores will be obtained and tested at four month intervals for a period of five years. The field and test data will be sent to the Coordinating Agency, University of Idaho for evaluation.

C. BUDGET FOR FY 1979 ----- \$10,000

D. EXPENDITURES TO DATE

FY 78 to 4-1-78 -----	\$5,500
Estimate 4-1 to 7-1-78 -----	<u>7,100</u>
	\$12,600

E. REPORTING

Monthly reports will be submitted. The Interim report is two years and Final report at the end of five years will be submitted by the Coordinating Agency.

PART II - Continued

A. IDENTIFICATION

Title: Procedures and Materials for Roadside Development

State Project Number: 7918

Federal Designation: Type A Continuing Study

Research Organization: Montana State University

Approval Date: July 1, 1970

B. PROPOSED WORK

1. Publication of final report.

C. EXPENDITURES TO DATE

Expenditures To Date	\$204,243
Estimated Expenditures to 6-30-78	<u>3,120</u>
TOTAL	\$207,363

D. BUDGET FOR FY 1979 \$22,200

E. IMPLEMENTABLE ACCOMPLISHMENTS

Methods of mulching, seeding and temporary erosion control have been used on Montana's construction projects.

A. Identification

Title: High Pressure Liquid Chromotography (HPLC) As A Method
of Measuring Asphalt Composition

State Project Number: 7930

Federal Designation: Type A Continuing Study

Research Organization: Montana State University

Coordinating Agency: Montana Department of Highways

Approval Date: June 6, 1978

B. Proposed Work

1. Establish a workable procedure for HPLC analysis of asphalt which can be conveniently used and incorporated into existing quality control tests of asphalt.
2. This objective is composed of four portions. The combined results of these should provide criteria for establishing a high quality asphalt model for each of the commonly used penetration grades.
 - a. Analyze samples of asphalt obtained from the four Montana refineries and the various stages of processing within each refinery (Cenex, Phillips, Continental and Exxon).
 - b. Analyze the effects of prolonged thin film heating of asphalt including heating with a relatively inert aggregate.
 - c. Compare the changes that occur in asphalt when using the Boeing Drum Dryer with the changes in conventional processes such as a batch plant of continuous flow.
 - d. Analyze asphalt from new and old roads that vary in quality and original penetration.
3. Establish the differences and advisability of techniques in (a) extraction of asphalt from aggregate mixtures and (b) sub-fractionation of asphalt.

C. Budget for FY 1979

Salaries	\$20,464.00
Benefits	2,762.64
Overhead	11,613.32
Equipment	4,812.00
Supplies	1,000.00
Travel	500.00
Rental on HPLC instrument & Computer usage	5,000.00
Coring and laboratory analysis in Helena	<u>4,000.00</u>
Total	\$50,151.96 or \$50,200.00

PART II - Continued

A. IDENTIFICATION

Title: Contingencies and Proposed New Studies

B. PROPOSED WORK

1. Contingencies -----\$10,000

C. BUDGET FOR FY 1979

TOTAL ----- \$10,000

MONTANA PROJECT HPR-PL-1(17)
PART II WORK PROGRAM SUMMARY
FISCAL YEAR 1979

State Study No.	Type A or B	Study Title	Budget Estimate	Field Technical Coordinator	Field Project Advisor	Washington Headquarters Contact
8200		Administration of Research	\$ 29,000			H. H. Hersey (HRD-2)
8500		Transportation Research Board Correlation Service	\$ 24,700			
7926		Implementation	\$ 5,000	K. Carpenter	Non-FCP	
8519	A	Drainage Area Flow	\$ 56,500		L. Harrison (FCP 5H)	C. L. Shufflebarger (HDV-20)
7918		Roadside Development	\$ 22,000	H. Ollila	Fred Hempel (FCP 3F)	D. C. Woo (HRS-42)
7928	A	Predicting Moisture-Induced Damage to Asphalt	\$ 10,000	K. Carpenter	R. A. Bohman (FCP 4A)	F. G. Bank (HRS-42)
	A	(HPLC) As a Method of Measuring Asphalt Composition	\$ 50,200		Non-FCP	Gene K. Fong (HRS-22)
<u>CONTINGENCIES AND PROPOSED NEW STUDIES</u>						
Contingencies			\$ 10,000			
<u>STUDIES PENDING FINAL REPORT</u>						
7926-02		Predicting Moisture-Induced Damage to Asphalt Concrete (E-Modulus)		K. Carpenter	Non-FCP	C. L. Shufflebarger (HDV-20)
7927	A	Methodology for Prediction of Detrimental Volume Changes of Expansive Clays		K. Carpenter	D. Dolling (FCP 4D)	C. D. Ealy (HRS-21)
7929	A	Chemical Composition of Asphalt Cements		K. Carpenter	Non-FCP	J. Zarewicz (HRS-20)
Subtotal Part II			\$207,600			
Less USGS Funds			\$ 28,250			
Less Additional State Funds			\$ 5,100			
Total HPR Part II			\$174,250			

ESTIMATE OF ACTIVITIES
EXPENDITURES OF PLANNING AND RESEARCH BUREAU
FOR THE PERIOD OF JULY 1, 1978 - JUNE 30, 1979

HPR-PL-1(17)

PART III - NON-PARTICIPATING ITEMS

NP-1 Non-participating - U.S.G.S.

Objectives:

To cover the cost of additional funding of the Drainage
Area Flow Research project.

Estimated Costs 1979 FY: \$5,100

Total Non-Participating Items Part III \$5,100.

WORK PROGRAM HPR-PL-1(17)
FISCAL YEAR 1979

STATUS OF PL FUNDS

* * * *

A. Available as of July 1, 1978

Recipient Agency	ALLOCATED FUNDS		Total	PL-1(15) To Be Released	UNPROGRAMMED BALANCE		Total
	1977	FY 78			FY 77	FY 78	
Billings	\$ 73,157	\$ 73,157	\$146,314	\$25,938	\$ 16,594	\$ 73,157	\$115,689
Great Falls	<u>72,857</u>	<u>72,857</u>	<u>\$145,714</u>	<u>11,481</u>	<u>\$ 49,488</u>	<u>72,857</u>	<u>\$133,826</u>
TOTAL	\$146,014	\$146,014	\$292,028	\$37,419	\$ 66,082	\$146,014	\$249,515

B. Proposed PL Funding of Program FY 1979

Recipient Agency	Programmed Amount	Matching Share		Total	Unprogrammed Balance	
		State				
Billings	\$ 99,791	\$ 24,949		\$124,740	\$ 15,898	
Great Falls	<u>73,600</u>	<u>18,400</u>		<u>92,000</u>	<u>60,226</u>	
	\$173,391	\$ 43,349		\$216,740	\$ 76,124	

WORK PROGRAM HPR-PL-1(17)

FISCAL YEAR 1979

FINANCIAL SUMMARY SHEET

* * * *

A. TOTAL ESTIMATED COSTS

Part I - Planning	\$ 1,514,590
Part II - Research	174,250
Subtotal Participating Items	\$ 1,688,840
Part III - Non-Participating Items U.S.G.S.	5,100
TOTAL PROGRAM	\$ 1,693,940

B. AVAILABLE FUNDS AS OF JULY 1, 1978

Fiscal Year	Type Funds	Apportionments	Balance
1977	HPR	\$ 915,839	\$ 41,376
1978	HPR	\$ 865,364	\$ 865,364
HPR-1(15)	Released	(Est.)	\$ 229,707
Subtotal	PL HPR funds available		\$ 1,136,447
1977	PL	\$ 146,014	\$ 66,082
1978	PL	\$ 146,014	\$ 146,014
PL-1(15)	to be released	(Est.)	\$ 37,419
Subtotal	PL funds available		\$ 249,515
TOTAL AVAILABLE FEDERAL FUNDS			\$ 1,385,962

C. PROPOSED FINANCING PROJECT HPR-PL-1(17)

FY/Type	Federal Funds	Federal Matching Ratio	State Funds	Total
HPR-1(15) To Be Released	\$ 229,707	82.00	\$ 50,423	\$ 280,130
1977 HPR	\$ 41,376	82.00	\$ 9,082	\$ 50,458
1978 HPR	\$ 865,364	82.00	\$ 189,958	\$ 1,055,322
1979 HPR (10-1-78)	\$ 70,676	82.00	\$ 15,514	\$ 86,190
Subtotal HPR	\$ 1,207,123		\$ 264,977	\$ 1,472,100
PL-1(15) To Be Released	\$ 37,419	80.00	\$ 9,355	\$ 46,774
1977 PL	\$ 66,082	80.00	\$ 16,521	\$ 82,603
1978 PL	\$ 69,890	80.00	\$ 17,473	\$ 87,363
Subtotal PL	\$ 173,391		\$ 43,349	\$ 216,740
TOTAL PARTICIPATING	\$ 1,380,514	81.74	\$ 308,326	\$ 1,688,840
Non-Participating U.S.G.S.			\$ 5,100	\$ 5,100
TOTAL PROGRAM	\$ 1,380,514		\$ 313,426	\$ 1,693,940
HPR Federal Fund Balance After July 1, 1978				\$ -0-
PL Federal Fund Balance After July 1, 1978				\$ 76,124

